

Assessing the Readability Level of Pre-Participation Documents:

An Essential Risk Management Requirement

ABSTRACT

When a participant signs a pre-participation agreement they verify that they have been informed of potential risks, understand the demands this activity will require, and comprehend the types of injuries that may occur as a result of participation. With an average reading level of 8th grade, however, most American adults are no match for the vocabulary included in most risk management forms. As a result, it is imperative that health, physical education and recreation professionals assess the readability level of such documents before utilization. Once the readability level of a document has been determined, this level can be compared with the estimated literacy rate of participants, and pre-participation instruction regarding the inherent risks associate with the activity can be enhanced.

Assessing the Readability Level of Participant Documents:

An Essential Risk Management Requirement

Allison J. McFarland, Ph.D., MBA
Associate Professor, Sport Management
Graduate Sport Management Program Director
Western Michigan University
Kalamazoo, Michigan 49008
269/ 387-2680 work phone
allison.mcfarland@wmich.edu

Submitted: August 2005

Assessing the Readability Level of Participant Documents:

An Essential Risk Management Requirement

Submitted: August 2005

From involvement in fund raising activities to participation on athletic teams, the consideration and signing of an assumption of risk form has become part of the pre-participation routine. Most sport coaches and managers understand the liability associated with activity programs, and have taken steps to minimize these risks. Included in these steps is the use of assumption of risk forms, exculpatory agreements and pre-participation medical releases. Fully aware of the hazards associated with sport activities, program directors have taken appropriate steps to ensure that risks are properly identified prior to participation (Cotton & Wolohan, 2003).

Given the nature of competitive sport activity, it is appropriate that documents designed to identify risks and invite others to assume these risks be drafted in such as way as to increase their legal strength. In our attempt to toughen these documents, we often forget that the average American adult is functionally literate at the 8th grade level (U.S. Department of Education, 2000). This raises an interesting question: Should assumption of risk forms be drafted for the average reader? Consider the following selections from an expertly crafted assumption of risk form (Venture Outdoors, 2005):

Although Venture Outdoors has taken reasonable steps to provide me with appropriate equipment and skilled staff for the outing for which I have registered, I acknowledge that the activities of this outing have risks, including certain risks which cannot be eliminated without destroying the unique character of the

activities. The same elements that contribute to the unique character of these activities can cause loss or damage to my equipment, accidental injury, illness, or in extreme cases, permanent trauma, disability or death

I am aware that Venture Outdoors activities include risks of my injury or death. I understand the description above of these risks is not complete and that other unknown or unanticipated risks may result in property loss, injury or death. I agree to assume responsibility for the inherent risks identified herein and those inherent risks not specifically identified. My participation in this activity is purely voluntary, no one is forcing me to participate, and I elect to participate in spite of and in full knowledge of the inherent risks.

These passages, and the document as a whole meet the criteria endorsed by the legal community to minimize legal risk. In its entirety, this assumption of risk form is exhaustive, meticulous, precise, and complete. It specifically identifies the potential risks associated with the recreational courses and outings, and painstakingly outlines the parameters within which these activities will occur. Key phrases are repeated for emphasis, and assumption of risk statements are combined with a comprehensive exculpatory agreement section. Its major limitation is that a reader must possess a post-secondary reading level to fully realize what s/he is signing.

What should managers and providers of athletic programs know about the concepts of readability and text comprehension? More importantly, what additional steps should be taken to ensure that participants fully understand the risks to which they consent?

The Concept of Readability

Simply defined, readability is the study of matching reader and text (Gililand, 1972). In its broadest sense, readability is the sum total of all those elements within a given document that affect the extent to which individuals understand, read at optimum speed, and find text interesting (Gililand, 1972; Chall, 1958; Klare, 1963; Fry, 1989). The primary goal of readability assessment tools is to estimate the reader's understanding of the material as a function of the reader's language competence, the subject matter of the text, and the syntactic complexity of the passage (Hittleman, 1978; Stahl, 2003; Gunning, 2003). Although both quantitative and qualitative methods of assessment may be utilized to determine the readability level of a written document, readability research generally centers on the use of formulae that estimate the relative difficulty of a passage by assessing word length/difficulty and sentence length.

Originally developed for use by educators, readability formulas and text comprehension assessments have been used to evaluate a myriad of other documents. Recent uses of readability instruments included the assessment of informed consent forms used by exercise and sport professionals (Cardinal et al., 1996, 2000), business communications (Courtis, 1987), Miranda warnings and waiver forms (Stone, 2000), patient education materials in Mental Health (Adkins & Singh, 2001), patient medication leaflets (Kirkpatrick & Mohler, 1999; Slaten, et al., 1999; Wilson, 1996), advertisements used in consumer publications (Shuptrine et al., 1981), product warranties (Shuptrine et al., 1980), and collegiate textbooks (Gallagher & Thompson, 1981; Clark & Kaminski, 1986; Flory et al., 1992).

Since the initial introduction of reading level assessment in the 1950s, numerous sources have been suggested as causes of reading difficulty. Among these causes, two factors consistently predicted the difficulty of a text: vocabulary and sentence length (Kearl, 1948; Stolurow & Newman, 1959). More recent reviews of readability factors (Chall and Dale, 1995, Meyer, 2003) supported and reinforced the use of word length/difficulty and sentence length formulas for making predictions about readability. Although unable to adjust for word derivations; slang, style and syntax; previously existing contextual knowledge; and personal interest in the subject matter, readability formulas have become a widely accepted method of estimating the average comprehension of a text by an average reader (Stahl, 2003; Meyer, 2003). It is important to note that other factors such as document legibility, length, print size, use of graphics and cultural relevance are also critical factors influencing reader comprehension (Hartley, 1990; Doak, et al., 1985; Cardinal, et al., 1996).

Readability Formulas

The most frequently used tool for determining readability is a readability formula. Readability formulas measure certain features of text which can be subjected to mathematical calculations and can provide predictive information regarding how easily a text will be understood by the average reader (Chall & Dale, 1995; Fry, 1989). Previously calculated by hand, computer programs now dissect passages in less time and with a higher degree of precision (Mailloux et al, 1995). Readability levels are achieved by typing multiple passages from the document (most formulas require a minimum of 100 words per passage) into a software program designed for this purpose. Depending on the formula selected, passages of text will be identified by the computer program by

grade or reading level. Word processing programs such as Microsoft Word also include the capability of assessing the readability level of any highlighted text (see Table 1).

Included among popular formulas for estimating readability levels are the New Dale-Chall Readability Formula (Chall & Dale, 1995), the Spache Readability Formula (Spache, 1974), the Fry Readability Graph (Fry, 1977), the Flesch Reading Ease Formula (Flesch, 1949), and the Gunning Fog Index (Gunning, 1968). Readability measures are primarily based on factors such as the number of words in the sentences and the number of letters or syllables per word (i.e., as a reflection of word frequency). From these counts sentence length and word length are combined within each formula to compute the estimated readability level.

The Gunning Fog Index (Gunning, 1968) along with the Flesch Reading Ease Formula (Flesch, 1949) are often most often used to measure the readability of business-related communications and adult level documents (Clark, et al, 1990). Flesch Reading Ease scores can range from zero, for extremely difficult reading, to 100, for very easy reading. A score of 60 is considered plain English: about 20 words per sentence and 1.5 syllables per word. Today most US states require insurance documents to score between 40 and 50.

The Gunning-Fog Index (1968) is a rough measure of how many years of schooling it would take someone to understand the content of the document in question. Scores are reported in equivalent grades, from 0-12. The lower the number, the more understandable the content. Negative results are reported as zero, and numbers over twelve are reported as twelve. A score of seven would indicate that the reader must

demonstrate a 7th grade reading level for adequate comprehension. Although computer programs require less time, hand-calculation formulas may also be used (See Table 2).

Literacy Rates in the United States

Literacy is defined by the U.S. Department of Education as using printed and written information to function in society, to achieve one's goals, and to develop one's knowledge and potential (Lippman, 2001). Consequently, literacy is a measure of everyday functioning, rather than simply academic achievement. The U.S. Department of Education (1986) noted that an average person must have an 8th grade reading level to meet the literacy demands of American society. Given these parameters, recent estimates suggest that over 30 million Americans may be functionally illiterate (Digest of Education Statistics, 2000).

Additional data compiled by the National Adult Literacy Survey (1996) suggested that literacy proficiency is strongly related to levels of formal schooling. In general, proficiency on all dimensions of literacy is lowest for individuals who have not graduated from high school, higher for high school graduates and GED holders, and highest for individuals who have attended postsecondary schooling. This pattern is found for African-American, Hispanic, and White populations; for males and females; and for adults in all age ranges. Additional findings of the National Adult Literacy Survey (1996) suggested that older adults demonstrate lower literacy rates than their younger counterparts.

Central to the application of these statistics is the following inquiry: Did the individual who just signed your Assumption of Risk form possess sufficient reading skills that would allow him/her to read the page and to comprehend what s/he was reading? If

a patron's individual reading skills are significantly below that of the determined readability level of the document, it can be reasonably assumed that the individual was not likely to comprehend what they had just read (Stone, 2000).

Conclusion and Recommendations

The first line of defense in athletic programs is a well crafted assumption of risk form that delineates the risks associated with each activity, and is written at a level that is easily understood by the average American adult. A recent review of 45 activity-based assumption of risk forms representing various recreational and sport venues, however, yielded an post-secondary reading level (grade 12+) (McFarland, 2005). This level far surpasses the literacy level of the average adult in the United States. From a strategic point of view it would appear most effective to adapt the readability of assumption of risk forms to the lowest level of literacy of the population in which your organization operates. However, given the specifics and content requirements of such documents, this strategy may not always be feasible. There are, nevertheless, practical steps managers of recreational programs can take to increase the comprehension and retention of the substance contained in their assumption of risk forms.

Is it possible to retain the necessary components and terminology, yet still be assured that patrons understand what they are signing? Before distributing assumption of risk documents for participant signature, recreation managers should evaluate their document for legal content, text clarity, and reading difficulty. Both quantitative and qualitative approaches can be used for this type of investigation. A readability analysis should be performed with aid of a computer program or word processing tool. Equipped with this information, the difficulty of the text should then be judged in terms of your

participant's background, educational level, capabilities and interests (Gunning, 2003). Data regarding educational level for geographic regions is readily available from the U.S. Census website [www.census.gov], and a few minutes spent with patrons whose signature is requested will provide valuable insight into their document comprehension. The higher the readability level of your document, the more time your employees must spend ensuring that participants fully understand the risks associated with the activity in question.

When designing assumption of risk forms, several strategic changes can be made to enhance the comprehension of the reader/signer. These include (1) increasing the size of font, (2) avoiding or simplifying technical language, (3) including anecdotes to illustrate important concepts, (4) utilization of headings, subheadings, and short paragraphs, and (5) and inclusion of graphics (Gunning, 2003; Cardinal et al., 1996). Special consideration should be given to the age of the reader, and the amount of time allocated for reading the document. It is reasonable to conclude that regardless of their literacy level the more rushed a patron is to sign the document, the less content they will comprehend.

The primary objective of readability assessments has been to identify the level of skill needed for readers to comprehend printed documents. Examining assumption of risk forms for readability level and text coherence is an appropriate and necessary use of this educational tool. Moving beyond simply a legal examination of risk documents to an approach that considers the literacy level of the readers should prove beneficial to all parties involved.

References

- Adkins, A.D. & Singh, N.N. (2001). Reading level and readability of patient education materials in mental health. *Journal of Child and Family Studies*, 10(1), 1-8.
- Cardinal, B.J. (2000). Reduced readability has no effect on research participants' ability to understand an informed consent form: Implications for exercise and sport science research. *Research Quarterly for Exercise and Sport*, 71(1), A51.
- Cardinal, B.J., Martin, J.J. & Sachs, M.L. (1996). Readability of written informed consent forms used in exercise and sport psychology research. *Research Quarterly for Exercise and Sport*, 67, 360-363.
- Chall, J.S. & Dale, E. (1995). Manual for the new Dale-Chall readability formula. Cambridge, MA: Brookline Books.
- Chall, J.S. (1958). Readability: An appraisal of research and application. Columbus, OH: The Ohio State University Press.
- Clark, G.L., Kaminski, P.F. (1986). Readability of marketing principles textbooks: Another look at the data. *The Delta Pi Epsilon Journal*, 28, 181-196.
- Clark, L.C., Kaminski, P.F., Brown, G. (1990). The readability of advertisements and articles in trade journals. *Industrial Marketing Management*, 19, 251-260.
- Cotton, D.J., Wolohan, J.T. (2003). Law for recreation and sport managers (3rd Ed). Dubuque, IA: Kendall/Hunt.
- Courtis, J.K. (1987). Fry, SMOG, Lix and Rix: Insinuations about corporate business communications. *The Journal of Business Communication*, 24(2), 19-27.

- Doak, C.C., Doak, L.G., & Root, J.H. (1985). Teaching patients with low literacy skills. Philadelphia: Lippincott.
- Flesch, R. (1949). The art of readable writing. New York: Collier Books.
- Flory, S.M., Phillips, T.J., Tassin, M.F. (1992). Measuring readability: A comparison of accounting textbooks. *Journal of Accounting Education*, 10(1), 151-158.
- Fry, E. (1977). Fry's readability graph: Clarifications, validity, and extension to level 17. *Journal of Reading*, 21, 242-252.
- Fry, E. (1989). Reading formulas: Maligned but valid. *Journal of Reading*, 32, 292-297.
- Fry, E.B. (1968). A readability formula that saves time. *Journal of Reading* 11, 513-516, 578.
- Gallagher, D.J., Thompson, G.R. (1981). A readability analysis of selected introductory economics textbooks. *Journal of Economic Education*, 12(2), 60-63.
- Gilliland, J. (1972). Readability. London: University of London Press Ltd.
- Gray, W.B. (1975). How to measure readability. Philadelphia: Dorrance & Company.
- Gunning, R. (1968). The technique of clear writing. New York: McGraw-Hill.
- Gunning, T. G. (2003). The role of readability in today's classrooms. *Topics in Language Disorders*, 3, 175-189.
- Hartley, J. (1990). Is this chapter any use? Methods for evaluating a text. In J.R. Wilson & Corbett, E.N (Eds.). *Evaluation of human work: A practical ergonomics methodology* (p. 248-270). Bristol, PA: Taylor & Francis.
- Hittleman, D.R. (1978). Readability, readability formulas, and cloze: Selecting instructional materials. *Journal of Reading*, 22, 117-122.

- Kearl, B. (1948). A closer look at readability formulas. *Journalism Quarterly*, 25, 344-348,
- Kirkpatrick, M.F. & Mohler, C. (1999). Using the readability assessment instrument to evaluate patient medication leaflets. *Drug Information Journal*, 33, 557-563.
- Klare, G.R. (1963). The measurement of readability. Ames, IA: Iowa State University Press.
- Laura Lippman (2001) U.S. Department of Education Office of Educational Research and Improvement National Center for Education Statistics.
- Literacy of Older Adults in America (1996). Results from the National Adult Literacy Survey. Princeton, NJ: Educational Testing Service.
- Mailloux, S. L., Johnson, M.E., Fisher, D.G., and Pettibone, T.J. (1995) How reliable is computerized assessment of readability? *Computers in Nursing* 13, 221-225.
- McFarland, A. (2005). [Readability level of assumption of risk forms]. Unpublished raw data.
- McLaughlin, G.H. (1969). Smog grading: A new readability formula. *Journal of Reading* 12, 639-646.
- Meyer, B. (2003). Text coherence and readability. *Topics in Language Disorders*, 3, 204-224.
- Shuptrine, F. K. & McVicker, D.D. (1981). Readability levels of magazine ads. *Journal of Advertising Research*, 21(5), 45-51.
- Shuptrine, F.K. & Moore, E.M. (1980). Even after the Magnuson-Moss Act of 1975, warranties are not easy to understand. *Journal of Consumer Affairs*, 14, 393-404.

- Slaten, D., Parrott, R., Steiner, C. (1999). Readability of skin cancer prevention brochures targeting parents of young children. *Journal of the American Academy of Dermatology*, 40, 997-999.
- Spache, G.S. (1974). Good reading for poor readers (9th ed.). Champaign, IL: Garrard.
- Stahl, S.A. (2003). Vocabulary and readability: How knowing word meanings affects comprehension. *Topics in Language Disorders*, 3, 241-247.
- Stolurow, L.M. & Newman, J.R. (1959). A factorial analysis of objective features of printed language presumably related to reading difficulty. *Journal of Educational Research*, 52, 243-251.
- Stone, L. A. (2000, August). A demonstration of different estimations of readability for several forms of the Miranda warnings and associated waivers of rights. *Electronic Journal of Forensic Psychonomics*.
- United States Census Data (2000). www.census.gov
- United States Department of Education (1986). *Digest of Education Statistics*.
Washington DC: Office of Education Research and Improvement, United States Department of Education Center for Statistics.
- United States Department of Education (2000). *Digest of Education Statistics*.
Washington DC: Office of Education Research and Improvement, United States Department of Education Center for Statistics.
- Wilson, F.L. (1996). Patient education materials nurses use in community health. *Western Journal of Nursing Research*, 18, 195-205.

Venture Outdoors (2005). 304 Forbes Avenue, Pittsburgh, PA 15222.

www.ventureoutdoors.org

Table 1

Steps for Determining Readability Level Using Microsoft Word

Step 1: Open Microsoft Word document you wish to analyze

Step 2: Click on the Tools bar from the menu

Step 3: Choose “Options”

Step 4: Click on “Spelling and Grammar”

Step 5: Under the Grammar section, check the “Show Readability Statistics” box

Step 6: Click the “Okay” box

Step 7: Highlight a section of the document that includes at least 100 words.

Avoid the introductory and concluding paragraphs.

Step 8: Initiate the spelling and grammar check (under Tools in the top menu).

Step 9: At the completion of the spell check, Microsoft Word will present a box

that includes a word count for your selection, as well as Flesch Reading Ease
and Flesch-Kinkaid grade level readability statistics.

With the readability statistics box checked, Microsoft Word will provide an estimated readability level for your document or highlighted section every time you initiate a spell check.

Table 2

Hand Calculation Formulas for Estimating Readability Levels Using the Flesch Reading Ease and Gunning Fog Index

A. To manually calculate the Flesch Reading Ease Readability Estimate

1. Count the number of words in the document.
2. Count the number of syllables in the document.
3. Count the number of sentences in the document.
4. Calculate the average sentence length (ASL) value. To do this, divide the number of words in the document by the number of sentences in the document.
5. Calculate the average number of syllables per word (ASW) value. To do this, divide the number of syllables in the document by the number of words in the document.
6. Use the following formula to calculate the Flesch Reading Ease value of your document: $206.835 - (1.015 \times \text{ASL}) - (84.6 \times \text{ASW})$

B. To manually calculate the Gunning Fog Index Readability Estimate

1. Select a short passage and count the number of words.
2. Count the number of sentences within the passage
3. Count the number of big words (words with three or more syllables). Exclude words in which “es” or “ed” form the third or final syllable; hyphenated words like “state-of-the-art”; and compound words like “dishwasher”.
Using technical terms or jargon tends to increase Fog Index scores. If these are words with which the audience is familiar, don’t count them as big words.
4. Calculate the average sentence length by dividing the number of words by the number of sentences.
5. Calculate the percentage of big word by dividing the number of big words by the number of words, and multiplying by 100.
6. Add the average sentence length to the percentage of big words and multiply that result by 0.4.